

## Message Text

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ORIGIN EUR-12

INFO OCT-01 ISO-00 ERDA-07 FEA-01 ACDA-10 CEQ-01 CIAE-00

DOT-00 EPA-04 HEW-06 HUD-02 INR-07 INT-05 L-02

NSAE-00 NSC-05 NSF-02 OIC-02 PA-02 PM-03 PRS-01

SAJ-01 OES-05 SP-02 SS-15 TRSE-00 USIA-15 DODE-00

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DRAFTED BY EUR/RPM:ECAMPBELL

APPROVED BY EUR/RPM:DTELLEEN

ERDA:JBRESEE

ERDA:PJODOIN

EUR/IB:WKELLY

EPA:FAHARRIS

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P R 022105Z APR 75

FM SECSTATE WASHDC

TO AMEMBASSY LISBON PRIORITY

INFO USMISSION NATO

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E.O. 11652: N/A

TAGS CCMS, ENRG

SUBJECT: CCMS: SMALL POWER PLANTS GEOTHERMAL CONFERENCE,  
JUNE 2, 1975, BERKELEY, CALIFORNIA

REQUEST EMBASSY PASS FOLLOWING DRAFT INVITATION (PLUS  
AGENDA AND PROGRAM) WHICH US INTENDS TO ISSUE TO SUBJECT  
MEETING TO RELEVANT PORTUGUESE OFFICIALS FOR COMMENT. IN  
ABSENCE OF GOP PROBLEMS WITH MATERIAL, US WILL PROCEED TO  
ISSUE INVITATIONS. REQUEST ANSWER SOONEST.

BEGIN TEXT OF INVITATION

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INVITATION TO SMALL POWER PLANT MEETING

ONE OF THE ELEMENTS OF THE CCMS GEOTHERMAL ENERGY PILOT STUDY IS THE PROJECT FOR A SMALL GEOTHERMAL POWER PLANT. A PRELIMINARY OUTLINE DESCRIBING THE SEQUENCE OF ACTIVITIES WAS DISTRIBUTED IN OCTOBER, 1974; A REVISED VERSION IS ATTACHED. TWO MEETINGS ARE PLANNED FOR DISCUSSION OF THE PROJECT AND CONSIDERATION OF SPECIFIC ACTIVITIES AMONG THE PARTICIPATING COUNTRIES.

THE UNITED STATES AND PORTUGAL ARE CO-SPONSORING THE SMALL GEOTHERMAL POWER PLANT PROJECT. BECAUSE MANY INTERESTED

PEOPLE WILL BE IN SAN FRANCISCO IN MAY, 1975 FOR THE UN GEOTHERMAL SYMPOSIUM, THE UNITED STATES WILL HOST A ONE-DAY MEETING ON THE SMALL POWER PLANT PROJECT IN BERKELEY ON JUNE 2, 1975. THE SECOND MEETING, OF TWO OR THREE DAY DURATION, IS PLANNED FOR AUGUST, 1975, AND WILL BE HOSTED BY THE GOVERNMENT OF PORTUGAL IN THE AZORES, MOST LIKELY SAN MIGUEL. IT IS HOPED TO SCHEDULE SIDE TRIPS TO OTHER GEOTHERMAL SITES IN THE AZORES DURING THAT MEETING, POSSIBLY TO TERSEIRA.

AN AGENDA FOR THE BERKELEY MEETING IS ATTACHED. AS INDICATED BY THE AGENDA, THE EMPHASIS OF THE BERKELEY MEETING IS ONE THE BASIC CONCEPT OF A SMALL POWER PLANT DESIGNED WITH CONVENTIONAL EQUIPMENT.

THE SECOND MEETING, IN THE AZORES, WILL EMPHASIZE THE NEEDS OF THE USERS, PARTICULAR SITE CHARACTERISTICS, PAST EXPERIENCES AND POSSIBLE CONTRIBUTIONS OF PARTICIPATING COUNTRIES.

IT IS ASSUMED THAT PEOPLE PLANNING TO ATTEND THE BERKELEY MEETING WILL BE PARTICIPATING IN THE U.N. SYMPOSIUM IN SAN FRANCISCO. NAMES OF THOSE PEOPLE SHOULD BE SENT TO:

ANDERS W. LUNDBERG, L-505  
LAWRENCE LIVERMORE LABORATORY  
P.O. BOX 808  
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LIVERMORE, CALIFORNIA 94550

BY MAY 1, 1975. DETAILED INFORMATION REGARDING BUS TRANSPORTATION TO BERKELEY, ETC. WILL BE DELIVERED TO ATTENDEES DURING THE U.N. SYMPOSIUM. END INVITATION.

BEGIN TEXT OF AGENDA

CCMS - SMALL GEOTHERMAL POWER PLANT - 2 JUNE 1975

0900 INTRODUCTION DR. JAMES C. BRESEE, ERDA  
0930 REVIEW OF PROPOSED ANDERS W. LUNDBERG, LLL  
- OUTLINE  
BREAK  
1030 A SPECIFIC PROPOSAL ROGERS ENGINEERING  
- FOR A FLASHED STEAM COMPANY  
- SYSTEM

1200 LUNCH  
1330 OUTLINE PLANS FOR AZORES MEETING  
1530 TOUR OF CAMPUS, LAWRENCE HALL OF SCIENCE  
1700 END

BEGIN PROGRAM

SMALL POWER PLANTS FOR HOT WATER GEOTHERMAL RESOURCES

ABSTRACT

A THREE-PHASE PROGRAM IS OUTLINED FOR DESIGN OF SMALL (2-5 MW) POWER PLANTS FOR UTILIZATION OF HOT WATERS FROM GEOTHERMAL SOURCES. PHASE I SUMMARIZES APPROPRIATE INFORMATION AND EXPERIENCE, PHASE II IS APPLICATION OF THE CONCEPT TO A SPECIFIC SITE AND PHASE III IS A FINAL REPORT ON RESULTS.

DURING THE CCMS GEOTHERMAL ENERGY MEETING IN CALIFORNIA IN OCTOBER 1974, THERE WAS CONSIDERABLE INTEREST EXPRESSED IN THE POSSIBILITIES OF A JOINT PROJECT ON SMALL POWER PLANTS. THIS PAPER IS INTENDED TO BEGIN THE PROCESS OF DEFINING A WORTHWHILE JOINT PROJECT AND THE METHODS OF UNCLASSIFIED

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CARRYING IT OUT.

AMONG THE POTENTIAL PARTICIPATING COUNTRIES THERE IS A GREAT VARIETY OF NEEDS AND INTERESTS. THE PROGRAM OUTLINED BELOW WILL HELP ALL PARTICIPANTS BY SHARING EXPERIENCES, BY COMPILING THE INTERESTS, AND BY SUMMARIZING CAPABILITIES AND EXISTING NATIONAL ACTIVITIES RELATING TO SMALL POWER PLANTS.

THE PROJECT IS DIRECTED TOWARD UTILIZATION OF HOT WATER GEOTHERMAL RESOURCES IN LOCATIONS WHERE A LARGE GENERATING PLANT IS NOT JUSTIFIED. A BASIC SYSTEM CONCEPT INCLUDES EQUIPMENT ARRANGED IN MODULES FOR EASE OF TRANSPORTATION AND INSTALLATION. THE TENTATIVE SIZE RANGE IS 2-5 MW. ALL COMPONENTS ARE TO BE CONVENTIONAL ITEMS, AVAILABLE

WITHOUT DEVELOPMENT EFFORT.

THE RATIONALE FOR CONVENTIONAL COMPONENTS IS THAT THEY ARE CURRENTLY AVAILABLE, ON TIME SCHEDULES CONSISTENT WITH THE OBJECTIVES OF A CCMS PROJECT ON SMALL GEOTHERMAL POWER PLANTS. OPERATING EXPERIENCE IS NEEDED FOR MANY OF THE KNOWN GEOTHERMAL AREAS OF THE WORLD. PRIME MOVERS UNIQUELY DESIGNED FOR THE GEOTHERMAL ENVIRONMENT ARE IN DEVELOPMENT IN MANY PLACES, BUT WILL NOT BE SUFFICIENTLY CHARACTERIZED IN TIME FOR AN APPLICATION IN APPROXIMATELY THREE YEARS.

EXPERIMENTAL MODELS ARE NOT CONSIDERED APPROPRIATE FOR A DEMONSTRATION APPLICATION.

THREE PHASES OF ACTIVITY CAN BE IDENTIFIED IN THE COMPLETE PROJECT.

PHASE I: A REPORT, TO BE COMPLETED BY JANUARY 1976, CONSISTING OF SIX PARTS.

- A. SYSTEM CONCEPT DESCRIPTION
  - B. SUMMARY OF POSSIBLE SITES FOR APPLICATIONS
  - C. ALTERNATE DESIGNS FOR SYSTEM ELEMENTS
  - D. DESIGN INFORMATION FOR COMPLETE SYSTEM
  - E. SUMMARY OF EXPERIENCES WITH SMALL POWER PLANTS
  - F. ANNOTATED BIBLIOGRAPHY PERTAINING TO SMALL POWER
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PLANTS

- G. LIST OF SUPPLIERS OF EQUIPMENT AND SERVICES

AMPLIFYING PARTS OF PHASE I, WE WOULD DEFINE A "SYSTEM" AS CONSISTING OF A SEPARATOR, TURBINE, AND GENERATOR (INCLUDING APPROPRIATE ELECTRICAL CONTROL EQUIPMENT.) ALL OF THESE ITEMS SHOULD CONSIST OF CONVENTIONAL EQUIPMENT, REQUIRING LIMITED DESIGN EFFORT AND NO DEVELOPMENT.

ITEM (D), "DESIGN INFORMATION," REFERS TO A LISTING OF EQUIPMENT AVAILABLE FROM THE PARTICIPATING COUNTRIES. DATA WILL BE PRESENTED IN TABULAR FORM OR GRAPHICALLY TO SHOW THE RANGE OF OPERATING CONDITIONS FOR EACH ELEMENT OF THE OVERALL SYSTEM.

ALTERNATE DESIGNS MIGHT CONSIST OF VARIATIONS, INCLUDING, FOR EXAMPLE, TYPES OF SEPARATORS, INCLUSION OF SCRUBBERS, IMPULSE VERSUS REACTION TURBINES; SINGLE VERSUS MULTIPLE TURBINE STAGES.

PHASE II: APPLICATION OF THE CONCEPT TO ONE OR MORE PARTICULAR SITES.

THE SITE SELECTED FOR A DEMONSTRATION SHOULD BE REPRESENTATIVE OF THOSE POTENTIALLY SUITABLE FOR APPLICATION OF THE CONCEPT. THE DATA EXTRACTED FROM AN INITIAL APPLICATION SHOULD BE USEFUL IN PLANNING UTILIZATION OF OTHER AVAILABLE RESOURCES. THE PLANT SHOULD BE EASILY ACCESSIBLE FOR EXAMINATION AND EQUIPMENT INSTALLATION. THE CAPABILITIES AND INTERESTS OF THE HOME COUNTRY REGARDING SUPPORT FOR THE DEMONSTRATION UNIT MUST ALSO BE CONSIDERED.

PHASE III: A SUMMARY REPORT WILL BE PREPARED ON RESULTS AND EXPERIENCE GAINED FROM THE WORK OF PHASE II.

THE PRESENT SURGE OF ACTIVITY ON GEOTHERMAL ENERGY MAKES IT IMPOSSIBLE TO SETTLE ALL ASPECTS OF THE TOPIC OF SMALL POWER PLANTS. HOWEVER, INFORMATION ON SPECIFIC SITE REQUIREMENTS, A SUMMARY OF RELATED EXPERIENCE AND DESIGN DATA FOR AVAILABLE TECHNOLOGY SHOULD PERMIT CON-

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SIDERATION OF THE APPLICATION OF SMALL GEOTHERMAL POWER PLANTS IN MANY PLACES.

COMMENTS ARE REQUESTED ON THE GENERAL NATURE OF THIS PROGRAM AND THE TENTATIVE TIME SCHEDULE SUGGESTED BELOW. A FIRM SCHEDULE WILL BE ESTABLISHED AT A LATER DATE. OF PARTICULAR INTEREST TO THE UNITED STATES, TO HELP IN FORMULATION OF DETAILED PLANS, IS A STATEMENT OF EACH PARTICIPATING COUNTRY'S GENERAL OBJECTIVES PERTAINING TO SMALL GEOTHERMAL POWER PLANTS. ALSO, EACH PARTICIPATING COUNTRY SHOULD NAME AN INDIVIDUAL TO ACT AS COORDINATOR FOR THE PROJECT.

A TENTATIVE PHASE I TIME SCALE FOLLOWS:

- A. DISTRIBUTE PROGRAM PLAN TO POTENTIAL   APRIL, 1975
- PARTICIPANTS
- B. MEETING TO DISCUSS DETAILS           JUNE, 1975
- C. MEETING RELATIVE TO USER APPLICATION   AUGUST, 1975
- D. COLLECT RESPONSES TO SUGGESTED       DECEMBER, 1975
- PROGRAM
- E. COMPILE AVAILABLE INFORMATION       APRIL, 1976
- F. DEVELOP DESIGN PROCEDURE           JULY, 1976
- G. PUBLISH REPORT OF PHASE I           SEPTEMBER, 1976

COMMENTS, SUGGESTIONS AND INFORMATION PERTAINING TO THIS PROJECT SHOULD BE SENT TO:

ANDERS W. LUNDBERG, L-505

LAWRENCE LIVERMORE LABORATORY  
P.O. BOX 808  
LIVERMORE, CALIFORNIA 94550  
U.S.A.

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## Message Attributes

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